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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/758,948	01/11/2001	Danan Dou	DP-300744	9639
22851	7590	07/27/2005	EXAMINER	
DELPHI TECHNOLOGIES, INC.			LISH, PETER J	
M/C 480-410-202			ART UNIT	
PO BOX 5052			PAPER NUMBER	
TROY, MI 48007			1754	

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/758,948	Applicant(s) DOU ET AL.	
	Examiner Peter J. Lish	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-11,13-16,39 and 41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-11,13-16,39 and 41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

*ll*

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/2/05 has been entered.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6-11, 13-16, 39, and 41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recite "early transition metal oxide". It is indefinite as to what specific metal oxides fall within this group, especially given the applicant's listing of various non-transition metal oxides (e.g. silica, alumina, etc.) as being included in this group.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 6, 15, 39, and 41 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamada et al. (US 6,221,804).

Yamada teaches an exhaust gas catalyst comprising an inner catalyst layer and an outer catalyst layer on a substrate, such as a honeycomb support made of cordierite. The porous support material for these catalyst layers may comprise aluminum oxide, ceria (cerium oxide), or at least one of the oxides of manganese, cobalt, titanium, and iron. The use of zirconia (zirconium oxide) is additionally taught in the examples. The support of the first catalyst layer is impregnated with noble metal, such as platinum. The support of the second catalyst layer is impregnated with noble metal, such as rhodium. Both supports are impregnated with a NO<sub>x</sub> adsorbent, such as at least one of the metals selected from the group including alkali metals, such as sodium or potassium, and alkaline earth metals. It is inherent that the alkali metals be mobile, as it is known that alkali metals are mobile at high temperatures. No difference is seen between the catalyst material of Yamada et al. and that of the instantly claimed invention.

Claims 1-4, 6, 15, 39, and 41 are rejected under 35 U.S.C. 102(e) as being anticipated by Hanaki et al. (US 6,514,905).

Hanaki teaches an exhaust gas catalyst comprising a monolithic carrier, or substrate, coated with a first coating layer and a second coating layer. The monolithic carrier is preferably

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formed of cordierite. The first coating layer is coated on the monolithic support and comprises refractory inorganic carrier and at least one of platinum or palladium. The second coating layer is coated on the first layer and comprises refractory inorganic carrier and both platinum and palladium. At least one of the first and second layers are impregnated with a NO<sub>x</sub> trapping substance selected from the alkali metals, e.g. potassium, sodium, and cesium. It is inherent that the alkali metals be mobile, as it is known that alkali metals are mobile at high temperatures. The catalyst and NO<sub>x</sub> trapping substances are carried on porous material such as alumina, although a mixture of alumina and titanium oxide is taught in example 11. The catalytic layers, or coatings, may additionally contain ceria (cerium oxide) or zirconia (zirconium oxide). No difference is seen between the catalyst material of Hanaki et al. and that of the instantly claimed invention.

Claims 1-4, 6-7, 15, 39, and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 09-057099.

JP '099 teaches a substrate having a first alkali metal coating thereon. A porous material supports a noble metal and an alkali metal over the alkali coating. This porous material may be any of alumina, silica, titania, and a zeolite. A higher concentration of alkali metal is present in the first alkali coating, preventing diffusion of the alkali metal from the second coating toward the substrate. In example 1 of this reference, cordierite as a substrate is coated with potassium nitrate solution and dried, forming a first support layer. Then, silica and alumina slurry was used to coat a porous support of silica and alumina onto the first support layer. Then, this porous support was impregnated with platinum and potassium. It is taught in paragraph [0011] that the

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first support layer may consist of a ceramic with alkali metal, such as the same porous support of the second layer. No difference is seen between the teaching of JP '099 and that of the instantly claimed invention.

Claims 7 and 14 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamada et al. (US 6,221,804) as applied above.

Yamada et al. does not specifically teach that the first layer, or "alkali barrier layer", is sufficient to substantially inhibit the migration of alkali material out of the adsorber, however, it is expected that this be the case, as the material of the layer is equivalent to that of the present application and its effect is therefore expected to be the same.

Regarding claim 14, the thickness of the barrier layer is not explicitly taught, however, it is expected that the layer be below about 100 microns, because of catalyst size restraints.

Claims 7 and 14 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hanaki et al. (US 6,514,905) as applied above.

Hanaki et al. does not specifically teach that the first layer, or "alkali barrier layer", is sufficient to substantially inhibit the migration of alkali material out of the adsorber, however, it is expected that this be the case, as the material of the layer is equivalent to that of the present application and its effect is therefore expected to be the same.

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Regarding claim 14, the thickness of the barrier layer is not explicitly taught, however, it is expected that the layer be below about 100 microns, because of the dimensions of figure 1 and also because of catalyst size restraints.

Claims 13-14 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 09-057099 as applied above.

JP '099 does not explicitly teach that the alkali metal barrier layer comprises an atomic film or a film having a thickness up to 100 micron. It is expected that the barrier layer formed as in example 1 comprises an atomic film, due to the method of its formation. It is furthermore expected that this film have a thickness of less than 100 microns.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US 6,221,804) as applied above.

Regarding claims 8-11, Yamada et al. does not explicitly teach the amount of additional "alkali metal barrier" loaded on the porous support. However, a variety of materials and ratios of those materials are taught and one of the combinations of materials and ratios is expected to

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result in the claimed amount of “alkali metal barrier” in the porous support. Thus, it would have been obvious to one of ordinary skill at the time of invention to select a combination of materials and ratios of these materials which results in an amount of “barrier material” within the claimed range.

Regarding claim 14, the thickness of the barrier layer is not explicitly taught, however, it would have been obvious to one of ordinary skill at the time of invention to form the layer with a thickness below about 100 microns, because of catalyst size restraints.

Claims 8-11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanaki et al. (US 6,514,905) as applied above.

Regarding claims 8-11, Hanaki et al. does not explicitly teach the amount of additional “alkali metal barrier” loaded on the porous support. However, a variety of materials and ratios of those materials are taught and one of the combinations of materials and ratios is expected to result in the claimed amount of “alkali metal barrier” in the porous support. Thus, it would have been obvious to one of ordinary skill at the time of invention to select a combination of materials and ratios of these materials which results in an amount of “barrier material” within the claimed range.

Regarding claim 14, the thickness of the barrier layer is not explicitly taught, however, it would have been obvious to one of ordinary skill at the time of invention to form the layer with a thickness below about 100 microns, because of catalyst size restraints.



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Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. as applied to claim 1 above, and further in view of EP 778072 A2.

Yamada et al. does not teach utilizing a three-way catalyst downstream of the absorber or as part of the absorber. However, EP '072 teaches a three way catalyst positioned downstream of a NO<sub>x</sub> absorber. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include a three way catalyst downstream the catalyst of Yamada et al. because EP '072 teaches a three way catalyst would oxidize any unreacted HC and CO which pass through the NO<sub>x</sub> trap and catalytic component and provide for NO<sub>x</sub> conversion during periods of stoichiometric engine operation and during purging of the NO<sub>x</sub> trap.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hanaki et al. as applied to claim 1 above, and further in view of EP 778072 A2.

Yamada et al. does not teach utilizing a three-way catalyst downstream of the absorber or as part of the absorber. However, EP '072 teaches a three way catalyst positioned downstream of a NO<sub>x</sub> absorber. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include a three way catalyst downstream the catalyst of Hanaki et al. because EP '072 teaches a three way catalyst would oxidize any unreacted HC and CO which pass through the NO<sub>x</sub> trap and catalytic component and provide for NO<sub>x</sub> conversion during periods of stoichiometric engine operation and during purging of the NO<sub>x</sub> trap.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J. Lish whose telephone number is 571-272-1354. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PL

  
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